



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/730,506 | 12/08/2003 | Dingjun Wu | 06387 USA | 2341 |

23543 7590 10/21/2005

AIR PRODUCTS AND CHEMICALS, INC.
PATENT DEPARTMENT
7201 HAMILTON BOULEVARD
ALLENTOWN, PA 181951501

EXAMINER

SPITZER, ROBERT H

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1724

DATE MAILED: 10/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------|--|
| Office Action Summary | Application No. 10/730,506 | Applicant(s) WU ET AL. | |
| | Examiner Robert H. Spitzer | Art Unit 1724 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/08/2003</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 14-18 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 is indefinite because in step c, line 1, there is no direct antecedent basis for the recitation of "the impregnated porous support". Claims 15-18 are indefinite because they depend from indefinite claim 14. Claim 31 is indefinite because it is a duplicate claim to claim 25. Either change the dependency of claim 31 or delete it.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13, 19-25 and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golden et al. (5,536,302) in view of either Otsuka et al. (2002/034467) or EP reference number 1,176,120 A1. Golden et al. ('302) show the use of an adsorbent made of a reduced metal oxide on a porous support for the removal of impurities from a hydride gas stream. The claims differ from the disclosure of Golden et al. ('302) in the further use of a desiccant material after the adsorbent for the removal of moisture. Either Otsuka et al. (2002/0034467) or EP 1,176,120 A1 (which appears to be for the same applicants as Otsuka et al.), show the use of an adsorbent containing a

Art Unit: 1724

reduced metal oxide and a desiccant material for the removal of contaminants from a feed gas stream. See specifically Tables 2-5 and their corresponding description. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use a desiccant material after the adsorbent of Golden et al. ('302), in view of the showing of either Otsuka et al. (2002/0034467) or EP 1,176,120 A1, so that any moisture which would affect downstream use of the feed gas will be removed.

5. Claims 14-18 and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golden et al. (5,536,302) in view of either Otsuka et al. (2002/0034467) or EP 1,176,120 A1, as applied in the paragraph directly above, further in view of Liu et al. (4,795,735). The claims differ from the disclosure of modified Golden et al. ('302) in the combining of the adsorbent and desiccant materials into a composite material. Liu et al. ('735) show the combining of activated carbon (adsorbent) and alumina (desiccant) to form a composite purification material. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the adsorbent and desiccant materials of modified Golden et al. ('302) into a composite material, in view of the showing of Liu et al. ('735), so that the material can be more efficiently utilized.

6. The remaining references listed on both the PTO-1449 and the PTO-892 show art of interest.

7. Applicants response to this Office action should also include the following editorial changes: para. [0007], line 2, "of" should be inserted after "removal"; para. [0020], line 4, "a" should be inserted after "has"; para. [0034], line 12, "of" should be

Art Unit: 1724

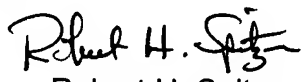
inserted after "layer"; para. [0037], line 5, "dessicants" should be "desiccants"; para. [0038], line 4, "dessicant" should be "desiccant"; claim 7, line 2, "is in the range of about" should be deleted as it is duplicative; and, in claim 8, line 1, "of" should be inserted after "removal".

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert H. Spitzer whose telephone number is (571) 272-1167. The examiner can normally be reached on Monday-Thursday from (5:30AM-4:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 3, 2005


Robert H. Spitzer
Primary Examiner
Art Unit 1724

October 3, 2005